AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A method of generating a detector position map for an array of detectors, the detector position map comprising a map which maps measured coordinates from a detection event to the detector in the array which detected the detection event, the method comprising the steps of:

illuminating an array of detectors with a source of radiation to generate a histogram, the histogram comprising an event count as a function of two dimensions, the two dimensions corresponding to a face of the array of detectors, wherein the histogram comprises a plurality of first peaks;

modifying the histogram to comprise a plurality of second peaks, wherein the second peaks have a greater degree of isolation from each other than the first peaks; and

for each detector, determining a region on the detector position map which corresponds to the detector, each region being based on a position of one of the second peaks;

wherein the step of modifying the histogram to comprise a plurality of second peaks comprises compressing the histogram by averaging adjacent pixels of the histogram; applying a low pass filter to the compressed histogram to produce a smoothed histogram; applying a Laplacian filter to the smoothed histogram to produce a Laplacian histogram; and modifying regions of the Laplacian histogram having values less than a threshold value to produce a thresholded histogram.

2.-5. (Canceled)

6. (Original) The method of claim 1, further comprising the step of eliminating a number of the second peaks in excess of the number of detectors in the array.

7. (Original) The method of claim 6, wherein the step of eliminating a number of second peaks in excess of the number of detectors in the array comprises the steps of:

(a) determining the number of second peaks in excess of the number of detectors in the array;

(b) identifying the pair of second peaks having the shortest distance between them;

(c) determining which of the pair has a lower value;

(d) deleting the lowest second peak in the pair; and

(e) repeating steps (b), (c) and (d) until the number of remaining second peaks equals the number of detectors in the array.

8. (Original) The method of claim 1, further comprising the step of assigning each second peak to a detector.

9. (Original) The method of claim 8, wherein the step of assigning each second peak to a detector comprises the steps of:

sorting the second peaks according to a first of two dimensions;

sorting the second peaks according to a second of two dimensions; and

matching each second peak to a detector.

10. (Original) The method of claim 1, wherein the step of determining a region on the detector position map comprises the step of determining a closest second peak for each coordinate pair.

11. (Original) The method of claim 1, further comprising the step of mapping an event having a coordinate pair to one of the detectors in the array based on the detector position map.

12. (Original) The method of claim 1, wherein the method is executed by a positron emission tomography scanner.

13. (Original) The method of claim 1, wherein the first peaks have a first average cross sectional area which is greater than a second average cross sectional area of the second peaks.

14. (Currently Amended) A method of generating a detector position map for an array of detectors, the detector position map comprising a map which maps measured coordinates from a detection event to the detector in the array which detected the detection event, the method comprising the steps of:

illuminating an array of detectors with a source of radiation to generate a histogram, the histogram comprising an event count as a function of two dimensions, the two dimensions corresponding to a face of the array of detectors, wherein the histogram comprises a plurality of peaks;

for each of the peaks, determining a pair of coordinates describing the position of the peak;

sorting each of the peaks according to their coordinates such that each of the peaks is associated with one of the detectors; and

for each detector, determining a region on the detector position map which corresponds to the detector;

wherein a Lapacian filter is applied to the histogram to produce a Laplacian histogram and wherein regions of the Laplacian histogram are modified having values less than a threshold value to produce a thresholded histogram.

15. (Original) The method of claim 14, wherein the sorting step is carried out with a bubble sort routine.

16. (Currently Amended) A method of generating a detector position map for an array of detectors, the detector position map comprising a map which maps measured coordinates from a detection event to the detector in the array which detected the detection event, the method comprising the steps of:

illuminating an array of detectors with a source of radiation to generate a histogram, the histogram comprising an event count as a function of two dimensions, the two dimensions corresponding to a face of the array of detectors;

modifying the histogram to comprise a plurality of isolated peaks;

and

for each detector, determining a region on the detector position map which corresponds to the detector, each region being based on a position of one of the isolated peaks;

wherein a Lapacian filter is applied to the histogram to produce a Laplacian histogram and wherein regions of the Laplacian histogram are modified having values less than a threshold value to produce a thresholded histogram.

17. (Original) A method of generating a detector position map for a positron emission tomography scanner, the method comprising the steps of:

illuminating an array of detectors with a source of radiation to generate a histogram, the histogram comprising an event count as a function of two dimensions;

applying a low pass filter to the histogram to produce a smoothed histogram;

applying a Laplacian filter to the smoothed histogram to produce a Laplacian histogram;

applying a threshold criterion to the Laplacian histogram to produce a thresholded histogram;

mapping peaks from the thresholded histogram to respective detectors in the array of detectors; and

generating a detector position map based on locations of the peaks.

18. (Original) A system for generating a detector position map for an array of detectors, the detector position map comprising a map which maps measured coordinates from a detection event to the detector in the array which detected the detection event, the system comprising:

a memory; and

a processor which:

receives a plurality of event data packets, each event data packet comprising a coordinate pair;

stores the plurality of event data packets in the form of a histogram in the memory, the histogram comprising an event count as a function of two dimensions, the two dimensions corresponding to a face of the array of detectors, wherein the histogram comprises a plurality of first peaks;

modifies the histogram to comprise a plurality of second peaks, wherein the second peaks have a greater degree of isolation from each other than the first peaks;

for each detector, determines a region on the detector position map which corresponds to the detector, each region being based on a position of one of the second peaks; and

stores each region in the memory to create the detector position map.

19. (Original) A system for generating a detector position map for an array of detectors, the detector position map comprising a map which maps measured coordinates from a detection event to the detector in the array which detected the detection event, the system comprising:

a memory; and

a processor which:

receives a plurality of event data packets, each event data packet comprising a coordinate pair;

stores the plurality of event data packets in the form of a histogram in the memory, the histogram comprising an event count as a function of two dimensions, the two dimensions corresponding to a face of the array of detectors, wherein the histogram comprises a plurality of first peaks, the plurality of first peaks having a first average cross section;

modifies the histogram to comprise a plurality of second peaks, wherein the second peaks have a second average cross section which is less than the first average cross section;

for each detector, determines a region on the detector position map which corresponds to the detector, each region being based on a position of one of the second peaks; and

stores each region in the memory to create the detector position map.

20. (Original) The system of claim 19, wherein the detector position map is adapted to be used with a positron emission tomography scanner.

21. (Original) The system of claim, 19, wherein the processor is further adapted to eliminate a number of the second peaks in excess of the number of detectors in the array.